Self-Erecting Communications Infrastructure, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

Cornerstone Research Group Inc. (CRG) proposes to significantly improve the performance of communication systems and networks for lunar and interplanetary exploration by engineering a novel communications tower using an emerging structures technology called Veritex

TM

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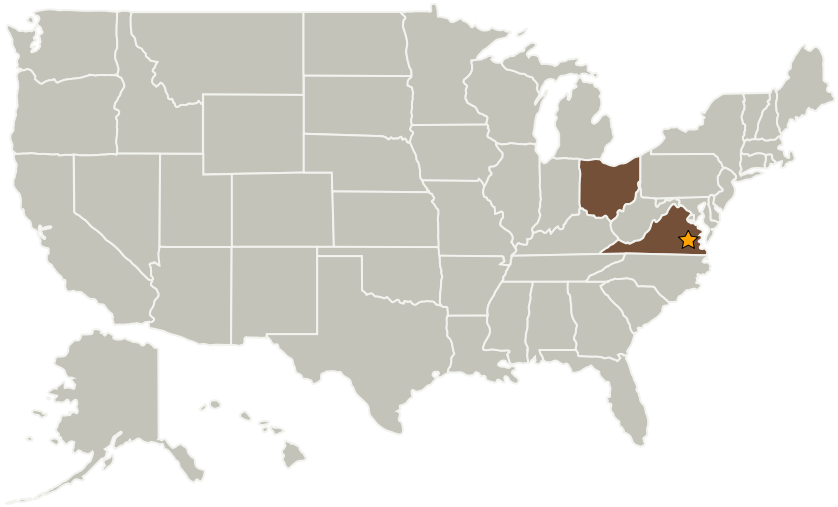
TM

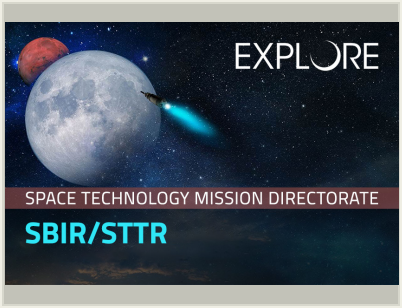
is a new structures technology based on shape memory polymer that offers the strength-to-weight ratio of high-performance composites and enables dramatic physical reconfiguration. One of the best applications of Veritex

TM

is to reduce the volume fraction of structures during shipping. CRG's Future Systems Group will use this technology to engineer a low mass, low packing volume, self-erecting communications tower technology for lunar and interplanetary exploration operations. The innovation of this proposal is in the scale-up of existing deployable structures technology from 3 to 30 meter scale and the engineering of a self-erecting tower. With this innovation in place, lunar communication challenges such as increased point-to-point range, reduced power requirements, large area coverage, and minimized dead-zones will be overcome. During Phase 1, CRG will demonstrate that this technology is both technically feasible and cost effective for lunar operations, maximizing return on investment for exploration operations. During Phase 2, CRG will prototype a large-scale, fully operational tower for demonstration purposes.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Cornerstone Research Group, Inc.	Supporting Organization	Industry	Miamisburg, Ohio

Primary U.S. Work Locations	
Ohio	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.6 Innovative Antennas